Electronic Supplementary Information

Enzyme-instructed self-assembly leads to activation of optical properties for selective fluorescence detection and photodynamic ablation of cancer cells

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Figures

**Fig. S1** LC-MS spectra of compound 2 (the stars represent systemic peaks).
Fig. S2 $^1$H NMR spectrum of compound 2 in DMSO-$d_6$. 
Fig. S3 HR-MS spectrum of compound 2.
Fig. S4 LC spectra of TPE-Py-FpYpYGpYGpY (the stars represent systemic peaks).
Fig. S5 $^1$H NMR spectrum of TPE-Py-FpYGpYGpY in DMSO-$d_6$. 
**Fig. S6** HR-MS spectrum of TPE-Py-FpYGpYGpY.

**Fig. S7** UV-vis absorption spectra of different samples as indicated in PBS buffer.
Fig. S8 Plot of $(I-I_0)/I_0$ versus (A) different enzymes, important ions and biomolecules as well as (B) various amino acids. $I$ and $I_0$ are the PL intensities at 600 nm of TPE-Py-FpYGpYGpY (10 μM) with and without treatment at 37 °C for 30 min. 1 U mL$^{-1}$ for ALP, lysozyme, lipase, and urease; 100 μg mL$^{-1}$ for trypsin and laccase; 1 mM for K$^+$, Na$^+$, Mg$^{2+}$, GSH, and amino acids.
Fig. S9 CLSM images of live HEK293T cells and Saos-2 cancer cells without any probe incubation.
**Fig. S10** CLSM images of live HEK293T cells and Saos-2 cancer cells incubated with TPE-Py-N₃ (5 μM) at 37 °C for 2 h.
**Fig. S11** CLSM images of Saos-2 cancer cells incubated with TPE-Py-FpYGpYGpY (10 μM) at 37 °C for (A) 0.5 h, (B) 1 h, (C) 2 h, and (D) 4 h. CLSM images of HEK293T cells incubated with TPE-Py-FpYGpYGpY (10 μM) at 37 °C for (E) 0.5 h and (F) 4 h.
Fig. S12 Live/dead staining with CLSM imaging verifies the PDT efficacy of the probe on HEK293T cells and Saos-2 cancer cells.